Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

CONDITIONAL MAJOR (DRAFT PERMIT) NO. F-05-023
HK SYSTEMS INCORPORATED
HEBRON KY.
AUGUST 18, 2005
BRIAN BALLARD, REVIEWER

SOURCE I.D. #:	021-015-00078
SOURCE A.I. #:	188
ACTIVITY #:	APE20050001

SOURCE DESCRIPTION:

This source manufactures conveyors and conveyor parts. Prior to painting, the conveyor sections and parts are cleaned, rinsed with water, and pretreated with a dilute phosphoric acid solution at the phosphatizer. The parts are sprayed in an enclosed system. The phosphoric acid solution temperature is in the range of 120 – 130 ºF. There are no controls associated with this emission point.

After pretreatment, the parts move by conveyor through a process heater. The only emissions here are the products of natural gas combustion. The conveyor then carries the parts to the spray booths where they are painted and dried in the ovens.

The #1 and #2 spray booths are equipped with incinerators to control VOC emissions. The incinerators are in series and operate at a temperature of 1400 ºF. The incinerators are only used when oil based paint is sprayed. The incinerators are natural gas-fired. Most paints used at these spray booths are water based. The particulate emissions from the over spray are controlled by filters.

The #3 and #4 spray booths exhaust uncontrolled. The particulate emissions from the over spray are controlled by filters.

The permits previously issued to this source are: C-83-051, O-83-206, S-95-163, and S-95-163 (Revised). A no permit required letter was issued in 1987 for the construction of the fourth spray booth. Permit S-95-163 authorized the addition of new phosphatizer to replace the existing phosphatizer, addition of an oven, addition of an incinerator and authorized an increase in paint usage for the existing spray booths. Previous to the issuance of S-95-163, the source had qualified under 401 KAR 59:225, Section 6(3) to be exempt from the standard for VOC emissions in 401 KAR 59:225, Section 3 because VOC emissions were less than 20 tons per year. The source was no longer able to meet the 20 tons per requirement with the increase in paint usage authorized by S-95-163. As a result S-95-163 had requirements for 85 % control for spray booths #1 and #2. Spray booths #3 and #4 were exempt from the 85 % control requirement by meeting the exemption criteria in 401 KAR 59:225, Section 6(1)(b).

On June 17, 2005, the Division received a letter from HK Systems, Incorporated requesting a 20 tons per limit on VOC. It should be noted that paints used at this facility contain ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol) (Chemical Abstract Service (CAS) No. 111-76-2), which was considered a HAP under the general category "Glycol Ethers." Ethylene glycol monobutyl ether was removed from the list of Hazardous Air Pollutants in Section 112 (b) (1) of the Clean Air Act (CAA). See Federal Register: November 29, 2004 (Volume 69, Number 228), Rules and Regulations, Page 69320-69325. It should be understood that EGBE is however by definition a VOC and EGBE emissions should be counted toward total VOC emissions.

COMMENTS:

The emissions of VOC and HAP from the spray booths are calculated by material balance using Material Safety Data Sheets (MSDS) for paints used in 2004. The maximum paint application rate is 3.5 gallons per hour each for spray booths #1 and #2 and 1.2 gallons per hour each for spray booths #3 and #4. The emission factor for particulate is calculated assuming a transfer efficiency of 40 %. The filters are assumed to control 90 % of particulate emissions. The emission factors from natural gas combustion from the process heater and incinerators are referenced from EPA's Factor Information Retrieval (FIRE) Data System.

Regulation 401 KAR 59:010, New Process Operations is applicable to the particulate emissions from the spray booths. The lb/hour emissions of particulate from each spray booth will be well within the limits required by this regulation. Regulation 401 KAR 63:020, Potentially hazardous matter or toxic substances is applicable to the emissions of air toxics from the phosphatizer. Toxic emissions from the facility were modeled using the Industrial Source Complex-3 (ISC3) air dispersion model. The maximum annual concentration determined by the model occurs at the property boundary (Precisely at Point 4 (P4) on the geographical survey). Potential phosphoric acid emissions result in a maximum annual concentration of 14.07 $\mu g/m^3$ at P4 based on the average of meteorological data from the years of 1987 – 1991. This concentration is compared to the chronic reference exposure level (REL) recommended by the California Office of Environmental Health Hazard Assessment, http://www.oehha.org/air/chronic_rels/pdf/allchrels.pdf . The Chronic REL for phosphoric acid (CAS No. 7664-38-2) is 7.0 $\mu g/m^3$. The acceptable "target risk" for noncancer endpoints is a hazard index of 1 or less, where hazard index is defined as:

$$Hazard\ Index = \frac{Modeled\ Concentration\ of\ X}{Concentration\ of\ X\ in\ Table}$$

The Hazard Index for potential phosphoric acid emissions (3.94 tons/year) is calculated to be 2.0. The allowable emission rate of phosphoric acid that results in a Hazard Index of one (1) is 1.96 tons/year.

EMISSION AND OPERATING CAPS DESCRIPTION:

The source will have emission caps of 20 tons per consecutive twelve (12) month period for VOC and 1.96 tons per consecutive twelve (12) month period for phosphoric acid.

PERIODIC MONITORING:

The source will be required to maintain monthly records for the purpose of calculating HAP, VOC and phosphoric acid emissions. The source will be required to submit an emissions calculation work sheet, which utilizes product specific emission factors semi-annually. Other periodic monitoring requirements include weekly monitoring of opacity from the phosphatizer and spray booths. Also, daily monitoring of paint booth filter pressure drop is required for the for the spray booths.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.